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The Effectiveness of Local Wisdom-Based Electronic LKPD to Improve Learning Outcomes of Elementary School Students

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A B S T R A C T

The purpose of this research is to test the effectiveness of Electronic LKPD of local wisdom-based that were valid, practical, and effective to improve student learning outcomes, especially in science subjects in elementary school. The research design used is R&D: design, the procedure or stage of developing local wisdom-based Electronic LKPD used a development research procedure consisting of eight stages starting from finding potential and problems, until the report preparation stage. The average in the control group was 69.96, while the average of the experimental class was 83.31. The t-test results gained a Sig. value of 0.028 <0.05, it concluded that there was a significant difference between the average student learning outcomes of the control group and the experimental group. The N-Gain test results also show that the average N-Gain value for the control class is 25.1%, while the average N-Gain value for the experimental class is 58.3%. These results proved that electronic LKPDs based on local wisdom are effective as learning media to improve student learning outcomes. Electronic LKPDs based on local wisdom as teaching materials for learning Natural Sciences are more effective in improving student learning outcomes. Learning by using Electronic LKPD of local wisdom-based as a medium for learning Natural Sciences was more effective, which is indicated by the increase in student learning outcomes both cognitive and psychomotor. Learning by using this LKPD contributes to better student learning outcomes because with Electronic LKPD of local wisdom-based learning becomes effective, students were more interested and enthusiastic in learning. The conclusion of this research is that Electronic LKPD of local wisdom-based was effective as a learning media to improve student learning outcomes.

A R T I C L E   I N F O

1. INTRODUCTION

Based on Permendikbud Research No. 16 of 2022 concerning Process Standards in the fourth part of Article 8 How to Assess Achievement of Learning Objectives, paragraph (1) it is written that educators in carrying out assessments can use a variety of techniques and / or assessment instruments in accordance with the learning objectives to be achieved. Then the teacher in carrying out the assessment can be done creatively and innovatively in accordance with the learning objectives to be achieved by the teacher. One of the teaching materials for assessment sheets that teachers can develop is the Learner Worksheet (LKPD). LKPD is teaching material that contains guidelines and practice steps to solve problems in learning (Istikharah, 2017). The use of LKPD is an alternative to motivate students to increase their learning level (Faradisa et al., 2021).

Entering era 4.0, educators must be able to master and utilize technology (Bastudin, 2020). When conducting pre-research at SDN Lamper Lor in class V, there were problems in the implementation of learning, especially related to technology. Based on the results of observations, teachers when implementing online and offline learning have not been able to utilize technology optimally, especially when conducting assessments, namely in using LKPD. When learning offline, then providing learning feedback on LKPD teaching materials, teachers still used LKS or other package books to be photocopied and then given to students. When learning is carried out online, the teacher provides feedback by photographing the LKS and sending it to the class WhatsApp group, then students work in notebooks and collected the next day when students got their turn to enter school. The teacher also said that students were somewhat underestimating the assignments given by the teacher, because they do not submit assignments on time with the excuse of forgetting, not opening the WhatsApp group. This can cause learners to have low responsibility regarding their assignments. When distributing questionnaires, 16 out of 28 students answered that they were not interested in the LKPD given by the teacher, students commented that the LKPD given was boring, only in the form of writing that was photographed then copied and written in a notebook.

Based on the problems above, the method used by the teacher was less effective in carrying out the assessment. One thing that can be done by teachers is to develop LKPD into Electronic LKPD by utilizing computer technology, mobile phones or smartphones, laptops. With the development of this technology, teachers can improve the quality of learning. Through Electronic LKPD, it will be seen how students are involved in the learning process both directly (offline) and online (online).

LKPD that is packaged electronically will attract more attention from students (Darwis et al., 2019; Wahono et al., 2022, Abduraxmanova, 2022). In the results of his research entitled "Interactive E-LKPD Based on Local Wisdom on Balinese Script Material for Grade V Elementary School" when conducting a trial of Electronic LKPD to students showed the results that students were more enthusiastic about Electronic LKPD, because Electronic LKPD contains pictures, attractive colors and varied questions, then learning becomes interactive and fun (Wardani et al., 2022). Other researchers' findings state that Electronic LKPD can simplify and narrow the space so that the resulting learning becomes more effective (Ayuni, 2020; Syafitri & Tressyalina, 2020; Puteri, 2021; Tarigan et al., 2022; Sihombing et al., 2023). Furthermore, other researchers revealed that teachers can easily develop Electronic LKPD by using the access contained in the website that has been provided by the government, one of which is the live worksheet website (Lathifah et al., 2021).

The problems described above explain that technology has an important role. Especially in the field of education, technology can be used as a good system in developing teaching materials when carrying out learning in schools (Cahyati, 2022). The 2013 curriculum is one of the government's efforts as part of a strategy to achieve quality education goals. Therefore, in 21st century education, teachers must be creative and innovative in managing teaching materials that are collaborated with technology and adapted to the 2013 curriculum, as well as adapted to the characteristics of students and the school environment. Based on the description, the purpose of this research is to test the effectiveness of valid, practical, and effective local wisdom-based electronic LKPD to improve student learning outcomes, especially in science subjects in elementary school.

Learner Worksheet (LKPD) is one type of teaching material used to assist in the implementation of the learning process. In general, LKPD are sheets in the form of material, summaries, and instructions in the form of steps in order to be able to overcome the tasks that must be carried out (Amali et al., 2019; Boimau et al., 2022), 2019; Sari et al., 2020; Risana, 2021; Vadilla, 2022). Prastowo (2011) in his book said that LKPD is printed teaching material in the form of sheets of paper that contain material, summaries and instructions for carrying out tasks from learning material that must be done by students with reference to the Basic Competencies (KD) that must be achieved (Gultom, 2017; Yanti, 2021). Istikharah (2017) says that LKPD is teaching material that contains guidelines and practice steps to overcome problems in implementing learning. Based on the explanation above, the Learner Worksheet (LKPD) is a media of learning teaching materials in the form of feedback questions that refer to Basic Competencies, that the learning process is well achieved.

The form of LKPD that is currently being used widely is electronic LKPD, Electronic LKPD will certainly be more structured, so that it can be used as a learning resource for children, and children can learn without teacher guidance in achieving learning goals. Research conducted by Wati (2021) writes that the Electronic LKDP developed affects students' learning exercises to be more cheerful, effective and mobilizes students' enthusiasm for learning (Irwanto et al., 2022; Tressyalina et al., 2023). This is in line with Julian (2020) who said that the Electronic LKPD developed can create student interest and interest in learning. Electronic LKPD can also help students in understanding and arouse confidence when learning activities take place (Kusumasari et al., 2022).

Local wisdom found in a region/indigenous community contained many noble values of the nation's culture that are still strong and become the character identity of its citizens (Priyatna, 2017). Arafah (2020) explained that local wisdom can be interpreted as (local) ideas that give birth to wise attitudes, are good and have been followed and practiced in the community for generations and become a binder of togetherness. Local wisdom itself is a broad and comprehensive phenomenon (Njatrijani, 2018). The scope of local wisdom is quite numerous and diverse, making it difficult to be limited by space. The scope includes aspects of cultural economy, information technology and communication, ecology developed from regional potential, potential aspects of local excellence development which include natural resources, human resources, geographical, cultural and historical (Kun, 2013).

2. METHODS

The research design used is the Research and Development (R&D) design. The procedure or development stage of Electronic LKPD based on local wisdom uses a development research procedure which consists of eight stages starting from the define for potentials and problems, to the report preparation stage. This research was conducted at SDN Lamper Lor, South

Semarang District, Semarang City. When the research was carried out in semester 2 of the 2022/2023 academic year. The research subjects used in the study would be fifth grade students at SDN Lamper Lor Semarang, by determining the research subject using a saturated sampling technique where all members of the class V population at SDN Lamper Lor Semarang were used as samples. Data collection techniques included interviews, questionnaires, observation, documentation, and tests. Analysis of the effectiveness of data using N-Gain because to see an increase in student learning outcomes.

3. RESULTS AND DISCUSSION

Based on the results of the validity test of 10 questions in the electronic learner worksheet based on local wisdom (learning 1) was valid. The validity test results of 10 questions in the electronic learner worksheet based on local wisdom (learning 2) were valid. The validity test results of 10 questions in the electronic learner worksheet based on local wisdom (learning 5) were valid. Calculation of scores in LKPD using converted values, categorized according to the provisions of Permendikbud No. 81 A Year 2013. The range of learner worksheet scale scores was 0.00 - 4.00.

3.1 Description of Assessment Data of Electronic LKPD Learning 1

The category of learning outcomes of fifth grade students of Lamper Lor Semarang Elementary School on the provision of electronic LKPD learning media Learning 1 with the theme Environment of Our Friends and the sub-theme of Humans and their Environment can be seen in **Table 1** below.

Table 1. Categories of Assessment of Electronic LKPD Learning 1

No.	Criteria	Category	F	Percentage (%)
1	$3,33 <$ score $\leq 4,00$	Very Good	14	51,85
2	$2,33 <$ score $\leq 3,33$	Good	13	48,15
3	$1,33 <$ score $\leq 2,33$	Acceptable	0	0
4	Score $\leq 1,33$	Poor	0	0

Source: data processed (2023)

From **Table 1,** it seen that student learning outcomes came into 2 categories from the 4 categories set. Students in the very good category have a total of 14 students or 51.85%. While students who came into the good category with 13 students or 48.15%. From Table 1 above, it seen that electronic LKPD based on local wisdom can help students in achieving the Basic Competencies of learning. The learning outcomes of fifth grade students of Lamper Lor elementary school are more in the very good category, which was 51.85%.

3.2 Description of Assessment Data of Electronic LKPD Learning 2

The category of learning outcomes of fifth grade students of Lamper Lor Elementary School in the provision of Electronic Learning LKPD 2 can be seen in **Table 2** below.

Table 2. Categories of Assessment of Electronic LKPD Learning 2

No.	Criteria	Category	F	Percentage (%)
1	3,33 < skor ≤ 4,00	Very Good	15	55,56
2	2,33< skor ≤ 3,33	Good	12	44,44
3	1,33 < skor ≤ 2,33	Acceptable	0	0
4	Skor ≤ 1,33	Poor	0	0

Source: data processed (2023)

From **Table 2**, it can be seen that student learning outcomes came into 2 categories from the 4 categories. Students in the very good category have a total of 14 students or 55.56%. While students who came into the good category are 13 students or 44.44%. From Table 2 above, it can be seen that the electronic LKPD based on local wisdom in learning 2 can help students in achieving the Basic Competencies of learning. The learning outcomes of fifth grade students of Lamper Lor elementary school were more in very good category, which is 55.56%.

3.3 Description of Assessment Data of Electronic LKPD Learning 5

Category of learning outcomes of fifth grade students of Lamper Lor Semarang Elementary School on the provision of local wisdom-based Electronic LKPD in Science Learning 5 subjects will be assessed based on four categories, there are very good, good, acceptable and poor. as for student learning outcomes can be seen in **Table 3** below.

Table 2. Categories of Assessment of Electronic LKPD Learning 5

No.	Criteria	Category	F	Percentage (%)
1	3,33 < skor ≤ 4,00	Very Good	18	66,67
2	2,33< skor ≤ 3,33	Good	9	33,33
3	1,33 < skor ≤ 2,33	Acceptable	0	0
4	Skor ≤ 1,33	Poor	0	0

Source: data processed (2023)

From **Table 3**, it seen that student learning outcomes came into 2 categories from the 4 categories. Students in the very goof category have a total of 18 students or 66.67%. While students who came into the good category with as many as 9 students or 33.33%. From Table 4.17 above, it seen that electronic LKPD based on local wisdom can help students in achieving the Basic Competencies of learning. The learning outcomes of fifth grade students of Lamper Lor elementary school are more in the very good category, namely 66.67%.

3.4 Hypothesis Test
3.4.1 Mean Different Test

After both classes were normally distributed and have homogeneous variances, then the mean difference test is carried out with a two-party t-test using the SPSS 21.0 for Windows program using the Independent Sample T-Test assuming both variances were homogeneous (equal variances assumed) with a significance level of 0.05. After data processing using the SPSS 21.0 for Windows program, the output display seen in **Table 4** below.

**Table 4.** Group Statistics of Control and Experimental Classes

Group	N	Mean	Std. Deviation	Std. Error Mean	Group
Control	27	69,96	15,279	2,546	Control
Experiment	27	81,25	10,824	1,804	Experiment

Source: primary data processed (2023)

Based on **Table 4** above, it known the average value of student learning outcomes for the control group at the pretest stage was 69.96, it meant that it has not reached the minimum KKM value of 70 it concluded that the group of students who have not received treatment using electronic LKPD learning media was still lacking. While for the experimental group is 81.25 and it meant that the average learning outcomes of experimental class students have reached a value above 70. This statistic descriptive can be concluded that there was a difference in the average student learning outcomes between grade V elementary school before treatment as a control group with grade V elementary school after being given treatment as an experimental group.

In the std.deviation column, it known that the control group was 15.279 and is far below the average value (mean), in the experimental group a std.deviation value of 10.824 was also gained far below the mean value. These results indicated that the data in the study meant to be good or there was no deviation of data on the variables used.

The difference in the scores gained by students is greatly influenced by the media used in the learning process. Students will be more enthusiastic and eager to learn if the media used is interesting and easy for students to understand. The results of the scores of fifth grade students of SDN Lamper Lor Semarang before treatment and after treatment as follows, can see in **Figure 1.**
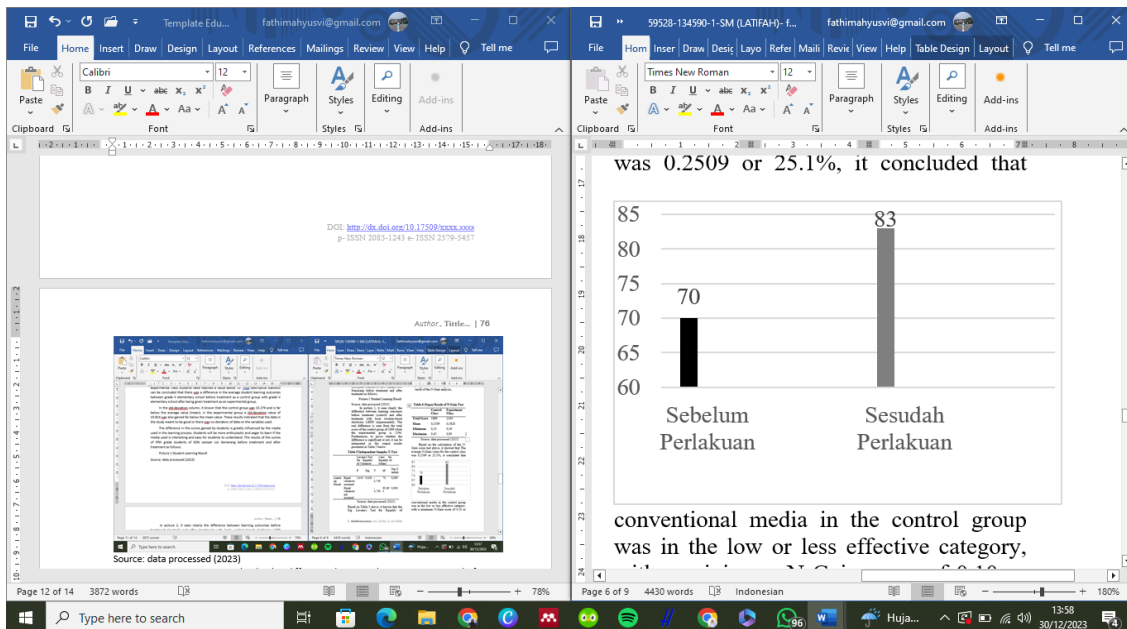
Figure 1. Student Learning Result
Source: data processed (2023)

In **Figure 1**, it seen clearly the difference between learning outcomes before treatment (control) and after treatment with local wisdom-based electronic LKPD (experimental). The real difference is seen from the total score of the control group of 1889 while the experimental group is 2194. Furthermore, to prove whether the difference is significant or not, it can be interpreted in the output results presented in **Table 5** below.

Table 5. Independent Samples T-Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	**Sig.**	**T**	**df**	**Sig (2 tailed)**
Learning Result	Equal variances assumed	5,010	0,028	-5,759	70	0,000
	Equal variances not assumed			-5,759	63,063	0,000

Source: data processed (2023)

Based on Table 5 above, it known that the Sig. Levene's Test for Equality of Variances was 0.028 <0.05, it can be concluded that H0 is rejected and Ha is accepted. Thus it can be concluded that there was a significant difference between the average student learning outcomes in class V SD as the control group and class V SD as the experimental group.

3.4.2 N-Gain Test

The N-Gain test is used to determine the improvement of student learning outcomes. The data used in the N Gain test was pretest and posttest data using the SPSS 21.0 for Windows program. The following **Table 6** was the result of the N-Gain analysis.

Table 6. Output Result of N-Gain Test

	Control Class	**Experiment Class**
Total Score	1889	2194
Mean	0,2509	0,5828
Minimum	0,10	0,36
Maximum	0,45	0,90

Source: data processed (2023)

Based on the calculation of the N-Gain score test above, it showed that The average N-Gain value for the control class was 0.2509 or 25.1%, it concluded that conventional media in the control group was in the low or less effective category, with a minimum N-Gain score of 0.10 or 10.39% and a maximum of 0.45 or 45.16%. Meanwhile, the average N-Gain score for the experimental class (Electronic LKPD based on local wisdom) was 0.5828 or 58.3%. It concluded that the Electronic LKPD based on local wisdom is included in the medium or moderately effective category, with a minimum N-Gain score of 0.36 or 36.36% and a maximum of 0.90 or 90.32%.

Based on the results of the general analysis that has been carried out in this study, it seen that the control group and the experimental group of SD Negeri Lamper Lor Semarang in the 2022/2023 academic year in the aspect of student learning outcomes gained categorization of students in the implementation of learning 1 gained 14 students or 51.85% of students in the very good category, while 13 students or 48.15% in the good category. In the implementation of learning 2, 15 students or 55.56% were in the very good category and 12 students or 44.44% were in the good category. And in the implementation of learning 5, 18

students were found to be in the very good category or 66.67%, and 9 students or 33.33% were in the good category. based on these results it can be concluded that there was a significant increase between learning 1, learning 2 and learning 5.

Based on the results of descriptive analysis of the effectiveness of local wisdom-based Electronic LKPD on student learning outcomes in general that has been done in this study, it seen that the learning outcomes of control group students and experimental groups at Lamper Lor Elementary School in the 2022/2023 academic year in the aspect of student learning outcomes gained the average in the control group was 69.96, while the average of the experimental class was 83.31. The minimum value of the control group students was 60 and the experimental group was 66. While the maximum value of the control group class students was 78 and the experimental group was 100. From these results, it concluded that learning with local wisdom-based Electronic LKPD on student learning outcomes was completed or met the KKM (70). This showed that the learning outcomes have met the predetermined success indicator of 80%.

Further, Electronic LKPDs based on local wisdom as teaching materials for learning Natural Sciences were more effective in improving student learning outcomes. This indicated from the percentage of the average value of the learning outcomes of the class that uses local wisdom-based Electronic LKPD as teaching materials for learning Natural Sciences (experimental class) around 83%. So learning by using Electronic LKPD based on local wisdom as a medium for learning Natural Sciences is more effective, which is indicated by the increase in student learning outcomes both cognitive and psychomotor. Learning by using Electronic LKPD based on local wisdom as a medium for learning Natural Sciences contributes to better student learning outcomes because with Electronic LKPD based on local wisdom learning becomes effective, students were more interested and enthusiastic in learning (Isnaini et al., 2022; Wahyuni, 2023).

Media utilization in learning also still rarely done by teachers. Teachers felt less skilled in using electronic learning teaching materials that in carrying out learning activities teachers still rule out the use of a medium, even though the essence of an electronic learning media in addition to increasing student interest can also help teachers in increasing student understanding of the material that students do not always have to listen what the teacher delivers, listening to lectures continuously in learning makes students bored. However, student learning outcomes also increase when teachers apply learning models. Electronic LKPD based on local wisdom was a medium which aimed to stimulate students to do active learning by finding themselves, investigating themselves, with problems given by the teacher that the results gained will be loyal and long-lasting in memory, will not be easily forgotten by students.

From the descriptive analysis explained, it concluded that student learning outcomes with local wisdom-based Electronic LKPD were better and more effective than conventional learning LKPD. This proven from the number of experimental class students more in the very good category as much as 67%. With Electronic LKPD based on local wisdom in Natural Science subjects, it showed that student learning outcomes in Human and Environmental material gained by students can be actively involved, learning was more meaningful, and able to increase according to the goals to be achieved and students. It meant that electronic LKPD based on local wisdom in science subjects Theme 8 Subtheme 1 has a significant effect on learning outcomes in natural science subjects Theme 8 Subtheme 1 Class V SD Lamper Lor Semarang.

This is linked with the results of research from Widiyanti, T. & Ana F.N. (2021) showed the results of research that the E-LKPD developed can improve student learning outcomes by looking at the results of the student learning process showing the results of the E-LKPD effectiveness test percentage of 82.81%.

From these results it concluded that the Electronic LKPD based on local wisdom in science subjects Theme 8 Subtheme 1 has a significant effect of 30.11% on learning outcomes on Human and Environmental material at SD Negeri Lamper Lor Semarang. The n-gain value of 0.4438 was included in the coefficient interval $0.3 \leq$ N-gain < 0.7 or moderate category. These results proved that learning Natural Sciences by using Electronic LKPD based on local wisdom as teaching materials for Natural Science learning will stimulate students to develop critical learning thinking, the most important of which was the creation of a cooperative and enjoyable atmosphere in the teaching and learning process. In line with the results of research from Wardani, et al., (2022) which showed that students are more enthusiastic about using LKPD developed using technology, because the Electronic LKPD developed contains pictures, attractive colors and varied questions, so that the implementation of learning becomes interactive and fun (Suryaningsih, 2021; .

4. CONCLUSION

The average in the control group was 69.96, while the average of the experimental class was 83.31. The t-test results gained a Sig. value of 0.028 <0.05, which concluded that there was a significant difference between the average student learning outcomes of the control group and the experimental group. The N-Gain test results also showed that the average N-Gain value for the control class is 25.1%, while the average N-Gain value for the experimental class is 58.3%. These results proved that Electronic LKPD based on local wisdom was effective as a learning media to improve student learning outcomes.

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